



SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMEQUEST 3800E2, Intel Xeon Gold 6240,
2.60GHz

SPECrate®2017_int_base = 446

SPECrate®2017_int_peak = Not Run

CPU2017 License: 19

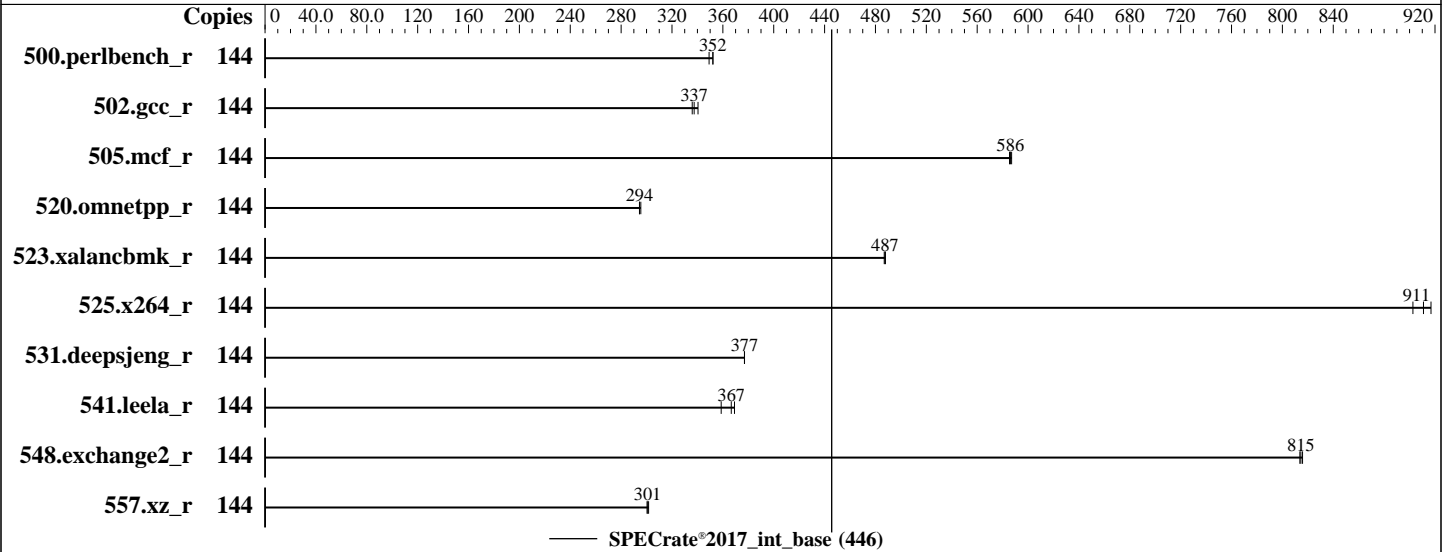
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019



Hardware

CPU Name: Intel Xeon Gold 6240
 Max MHz: 3900
 Nominal: 2600
 Enabled: 72 cores, 4 chips, 2 threads/core
 Orderable: 2,4 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 24.75 MB I+D on chip per chip
 Other: None
 Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)
 Storage: 1 x SAS HDD, 600GB, 10.5K RPM, SAS HDD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15
 4.12.14-25.28-default
 Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
 Compiler for Linux;
 Fortran: Version 19.0.1.144 of Intel Fortran
 Compiler for Linux
 Parallel: No
 Firmware: PRIMEQUEST 3800E2 Unified Firmware
 Version PB19043, Released Jun-2019
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None
 Power Management: --



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Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|-----------------|--------|-------------------|-------------------|-------------------|-------------------|---------|-------|--------|---------|-------|---------|-------|---------|-------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 500.perlbench_r | 144 | 657 | 349 | <u>651</u> | <u>352</u> | 651 | 352 | | | | | | | |
| 502.gcc_r | 144 | 607 | 336 | <u>604</u> | <u>337</u> | 599 | 340 | | | | | | | |
| 505.mcf_r | 144 | <u>397</u> | <u>586</u> | 396 | 587 | 398 | 585 | | | | | | | |
| 520.omnetpp_r | 144 | 639 | 295 | <u>642</u> | <u>294</u> | 642 | 294 | | | | | | | |
| 523.xalancbmk_r | 144 | 312 | 488 | <u>312</u> | <u>487</u> | 312 | 487 | | | | | | | |
| 525.x264_r | 144 | <u>277</u> | <u>911</u> | 279 | 903 | 275 | 917 | | | | | | | |
| 531.deepsjeng_r | 144 | 438 | 377 | <u>438</u> | <u>377</u> | 438 | 377 | | | | | | | |
| 541.leela_r | 144 | 665 | 359 | <u>650</u> | <u>367</u> | 646 | 369 | | | | | | | |
| 548.exchange2_r | 144 | 464 | 814 | <u>463</u> | <u>815</u> | 462 | 816 | | | | | | | |
| 557.xz_r | 144 | 518 | 300 | <u>517</u> | <u>301</u> | 516 | 302 | | | | | | | |

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Kernel Boot Parameter set with : nohz_full=1-143

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-int/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```
sync; echo 3> /proc/sys/vm/drop_caches
```

runcpu command invoked through numactl i.e.:

```
numactl --interleave=all runcpu <etc>
```

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

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General Notes (Continued)

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Platform Notes

```
DCU Streamer Prefetcher = Disabled
DDR4 Write Data CRC Protection = Disabled
HWPM Support = Native Mode with no legacy
Stale AtoS = Enabled
Sub Numa Clustering = Enabled
Uncore Frequency Scaling = Disabled
UPI Link L0p = Disabled
XPT Prefetch = Enabled
Fan Control = Full
Sysinfo program /home/Benchmark/speccpu2017-int/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-8r5c Thu Jun 27 14:05:31 2019
```

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

```
From /proc/cpuinfo
model name : Intel(R) Xeon(R) Gold 6240 CPU @ 2.60GHz
 4 "physical id"s (chips)
144 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 18
siblings  : 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
```

```
From lscpu:
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:             Little Endian
CPU(s):                 144
On-line CPU(s) list:   0-143
Thread(s) per core:    2
Core(s) per socket:    18
Socket(s):              4
NUMA node(s):          8
Vendor ID:              GenuineIntel
```

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Platform Notes (Continued)

```

CPU family:           6
Model:                85
Model name:           Intel(R) Xeon(R) Gold 6240 CPU @ 2.60GHz
Stepping:             6
CPU MHz:              2600.000
CPU max MHz:          3900.0000
CPU min MHz:          1000.0000
BogoMIPS:             5200.00
Virtualization:       VT-x
L1d cache:            32K
L1i cache:            32K
L2 cache:             1024K
L3 cache:             25344K
NUMA node0 CPU(s):   0-2,5,6,9,10,14,15,72-74,77,78,81,82,86,87
NUMA node1 CPU(s):   3,4,7,8,11-13,16,17,75,76,79,80,83-85,88,89
NUMA node2 CPU(s):   18-20,23,24,27,28,32,33,90-92,95,96,99,100,104,105
NUMA node3 CPU(s):   21,22,25,26,29-31,34,35,93,94,97,98,101-103,106,107
NUMA node4 CPU(s):   36-38,41,42,45,46,50,51,108-110,113,114,117,118,122,123
NUMA node5 CPU(s):   39,40,43,44,47-49,52,53,111,112,115,116,119-121,124,125
NUMA node6 CPU(s):   54-56,59,60,63,64,68,69,126-128,131,132,135,136,140,141
NUMA node7 CPU(s):   57,58,61,62,65-67,70,71,129,130,133,134,137-139,142,143
Flags:                fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bml hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
ospke avx512_vnni flush_lld arch_capabilities

```

```
/proc/cpuinfo cache data
cache size : 25344 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 8 nodes (0-7)
node 0 cpus: 0 1 2 5 6 9 10 14 15 72 73 74 77 78 81 82 86 87
node 0 size: 192264 MB
node 0 free: 191839 MB
node 1 cpus: 3 4 7 8 11 12 13 16 17 75 76 79 80 83 84 85 88 89
node 1 size: 193523 MB
node 1 free: 193338 MB
node 2 cpus: 18 19 20 23 24 27 28 32 33 90 91 92 95 96 99 100 104 105

```

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Platform Notes (Continued)

```

node 2 size: 193523 MB
node 2 free: 193334 MB
node 3 cpus: 21 22 25 26 29 30 31 34 35 93 94 97 98 101 102 103 106 107
node 3 size: 193523 MB
node 3 free: 193082 MB
node 4 cpus: 36 37 38 41 42 45 46 50 51 108 109 110 113 114 117 118 122 123
node 4 size: 193523 MB
node 4 free: 193333 MB
node 5 cpus: 39 40 43 44 47 48 49 52 53 111 112 115 116 119 120 121 124 125
node 5 size: 193523 MB
node 5 free: 193339 MB
node 6 cpus: 54 55 56 59 60 63 64 68 69 126 127 128 131 132 135 136 140 141
node 6 size: 193523 MB
node 6 free: 193353 MB
node 7 cpus: 57 58 61 62 65 66 67 70 71 129 130 133 134 137 138 139 142 143
node 7 size: 193291 MB
node 7 free: 193121 MB
node distances:
node 0 1 2 3 4 5 6 7
0: 10 11 20 20 20 20 28 28
1: 11 10 20 20 20 20 28 28
2: 20 20 10 11 28 28 20 20
3: 20 20 11 10 28 28 20 20
4: 20 20 28 28 10 11 20 20
5: 20 20 28 28 11 10 20 20
6: 28 28 20 20 20 20 10 11
7: 28 28 20 20 20 20 11 10

```

```

From /proc/meminfo
MemTotal: 1583819860 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15"
VERSION_ID="15"
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"

```

```

uname -a:
Linux linux-8r5c 4.12.14-25.28-default #1 SMP Wed Jan 16 20:00:47 UTC 2019 (dd6077c)
x86_64 x86_64 x86_64 GNU/Linux

```

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Platform Notes (Continued)

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Jun 27 13:29

SPEC is set to: /home/Benchmark/speccpu2017-int
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 142G 35G 107G 25% /home

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS FUJITSU V1.0.0.0 R1.16.0 for D3858-B1x 04/24/2019

Memory:

35x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
13x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

=====
C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
| 525.x264_r(base) 557.xz_r(base)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====
C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
| 541.leela_r(base)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
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Compiler Version Notes (Continued)

Fortran | 548.exchange2_r(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

icc -m64 -std=c11

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmallo

C++ benchmarks:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div

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Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-qopt-mem-layout-trans=4  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64  
-lqkmalloc
```

Fortran benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64  
-lqkmalloc
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.html>

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.xml>

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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